Innovative Nova Scotia

An Innovation Policy for the Nova Scotia Economy

NOVA SCOTIA

Economic Development

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This book was prepared by Nova Scotia Economic Development and published through Communications Nova Scotia.

ISBN 0-88871-811-X

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Summary

Introduction

Encouraging a climate of innovation has been a long-standing priority of the Government of Nova Scotia. An internal Research, Development, and Innovation (RDI) Policy framework has provided direction for government innovation-related activities since 1998.

The *Innovative Nova Scotia* policy framework has been developed to stimulate awareness of and discussion on the importance of maximizing the impact of innovation to enhance economic growth and employment in this province. *Innovative Nova Scotia* will help guide Government of Nova Scotia decision-making on how to best support innovation while providing all stakeholders with a clear focus for action.

This policy will provide government and all stakeholders with direction for the support of economic growth through innovation. The policy will become a fundamental support for the Government of Nova Scotia Economic Growth Strategy, *Opportunities for Prosperity*.

Building Innovative Nova Scotia

Innovation spurs productivity, and productivity, time and time again, has been shown to have a direct relationship to revenues and employment – in other words, to economic growth and prosperity.

Nova Scotians have a proud history of prospering through perseverance and creativity. Today, with the challenges facing some traditional resource-based industries and the increasing challenges from global competition, Nova Scotians are rising to the challenge again. We are adapting to changing times through innovative approaches to running our businesses, developing products, and finding new markets.

Now is the time for more of us to deepen our spirit of innovation. Now is the time for Nova Scotians to unite in applying our natural resourcefulness to take our innovation systems to a higher level. Now is the time to build Innovative Nova Scotia. The future belongs to the innovator.

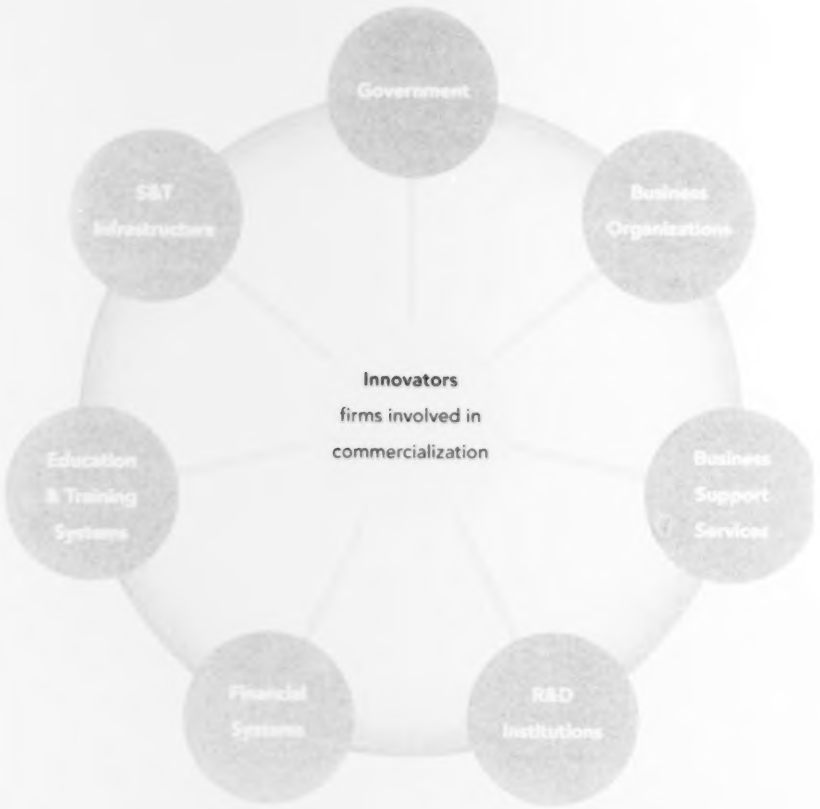
Goal

To grow and expand innovation in Nova Scotia so that it matches, or exceeds, the innovation performance of the leading regions in the nation.

Innovative Nova Scotia is aimed at growing and expanding innovation in Nova Scotia so that it matches or exceeds the innovation performance of the leading regions in the nation. The policy builds on the existing strengths in the province's innovation systems (defined as the set of institutions whose interactions positively influence the innovative performance of firms, see Figure 1) and leverages the historic ingenuity of Nova Scotians.

Innovative Nova Scotia is targeted at enabling Innovators by strengthening the innovation systems that are integral to the innovation process. The policy also recognizes the critical importance of developing the skills and capacities of the people who work within the innovation system. The policy is designed to assist innovators in all sectors of the economy and all regions of the province.

Through this policy, the Government of Nova Scotia will facilitate, not direct. The government will become a key influence in stimulating innovation in the province. We will work with the private sector, with all levels of government, with universities and colleges, with public institutions at all levels, and with all the other components of our innovation systems.



Innovative Nova Scotia

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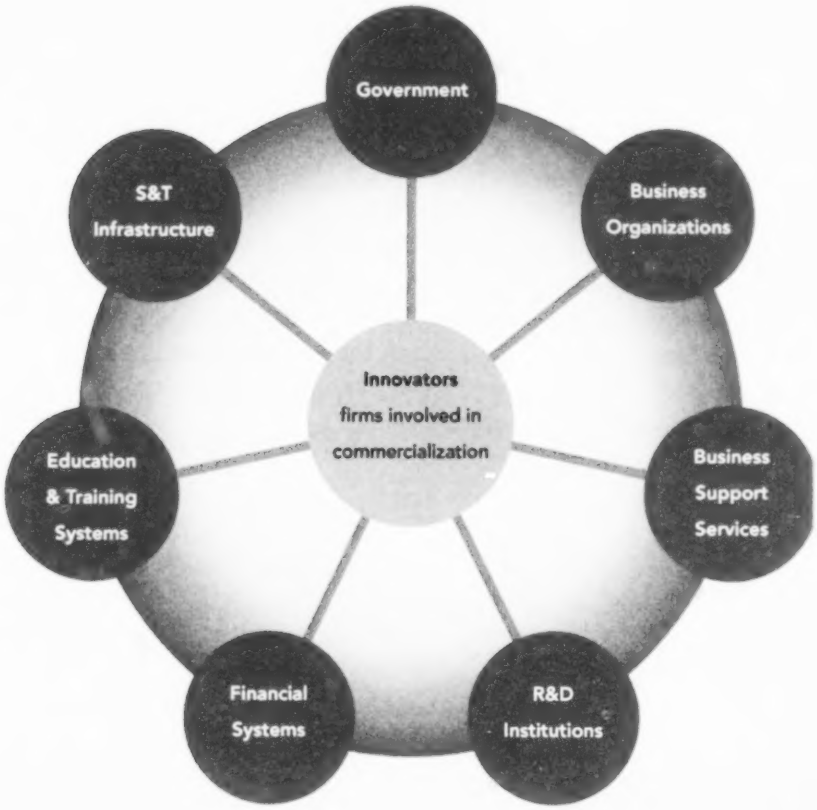
Figure 1 The Innovation System



Strategic Directions and Initiatives

The Government of Nova Scotia will address its objective to build up critical linkages and innovation infrastructure through a range of strategic directions and initiatives in five policy areas: R&D Support, Innovation Infrastructure Support, Human Resource Development, Commercialization Support, and Direct Government Action. The specific initiatives referenced below have been drawn from comments and suggestions made by Nova Scotians during the consultation processes that framed the development of *Innovative Nova Scotia*. These initiatives represent a proposed starting point for the implementation of the *Innovative Nova Scotia* policy.

R&D Support

- Support enhanced access to funds from granting councils and other innovation program funding sources by
  - establishing grants or providing expertise, or both, to support the development of proposals and business plans
  - providing access to facilitators to enable organizations across all sectors to form the alliances needed to access these funds

Innovation Infrastructure Support

- Provide support to firms that wish to undertake directed R&D with universities.
- Improve access to information on key resources in the innovation system, and on commercialization and science and technology generally, by developing an Internet-based innovation portal. Use the innovation portal and other vehicles to stimulate early-stage investment in firms by linking firms and investors.
- Support innovation-specific activities of new and existing networking organizations and sector associations.
- Support the development of innovation action plans and activities within and between regions, and at the community level, that support and augment the policy.
- Hold provincial and regional innovation summits to provide an opportunity for active sharing of ideas and experiences, as well as an opportunity to recognize innovation excellence in small and medium-sized enterprise (SME) throughout Nova Scotia.
- Establish mentoring programs using experienced executives to help SMEs become more innovative.

Human Resource Development

- Support programs that link firms with graduate students at Nova Scotia universities.
- Provide support and technical assistance to
  - encourage the development of customized training programs to meet the needs of innovative firms
  - increase access to existing programs, including on-line learning (especially in rural communities where access is an issue)
- Introduce programs to encourage the recruitment of technical and managerial expertise by SMEs to enhance commercialization capabilities within these firms.

Commercialization Support

- Examine opportunities for improved collaboration among existing commercialization-focused programs and between the agencies and organizations that provide these programs.
- Identify and address the under-served areas of innovation-related business planning, product-development management, marketing and distribution, and other business support services.
- Develop approaches and programs to help expand opportunities for innovators to access capital.

Direct Government Action

- Establish the Premier's Advisory Council on Innovation to provide broad, high-level support, direction, and linkages to help achieve the objectives of the Innovative Nova Scotia Policy framework.
- Review the effectiveness of the provincial contribution to the Scientific Research and Experimental Development (SR&ED) tax credit and implement changes where warranted.
- Evaluate the effectiveness of the existing system and approach for the administration and disbursement of funds from the Nova Scotia Research and Innovation Trust Fund. Consider options for longer term funding support.
- Leverage government's buying power to stimulate innovation activity in Nova Scotian firms.

1 Innovative Nova Scotia

1.1 The Importance of Innovation

Innovation spurs productivity. Productivity, time and time again, has been shown to have direct relationship to revenues and employment.

1.2 A Culture of Innovation

Nova Scotians have a history of prospering through perseverance and creativity. With the challenges facing some traditional resource-based industries, many Nova Scotians have adapted to changing times by adopting an innovative approach towards running their firms, developing new products, and finding new markets.

Our history can be the springboard for developing a pervasive culture of innovation. *The Nova Scotia spirit of innovation must permeate all sectors of our society.*

Innovation can be found everywhere, in people, companies, organizations, educational institutions, government, and communities. Innovation takes many forms:

- Using production, engineering, and organizational knowledge derived from hands-on experience, testing, and experimentation to create innovative processes and practices for manufacturing products and delivering services
- Adopting and utilizing process and technological innovations that are commercially available in the marketplace
- Combining this utilization of process and technological innovation with organizational change, innovative management practices, training, and upgrading of skills.

Some good examples include the firm that transforms unwanted fish by-products into marine-based nutritional products for sale on the worldwide marketplace; the manufacturer that integrates its suppliers' on-line catalogues with its procurement systems; and the craftsperson who uses computer-aided design software to quickly prototype and replicate ceramics.

We begin by defining the terms *innovation, innovator,* and *innovation system.*

1.3 Innovation

Innovation is defined as "the process by which new or improved products, services, practices, and processes are developed with an aim to commercialize."

An innovator is "an individual, a firm, or an organization that undertakes activities aimed at commercializing new products, services, practices, and processes."

"Firms" is used as shorthand to include individuals, businesses, and all other organizations that supply products and processes to the marketplace.

The Government of Nova Scotia has developed *Innovative Nova Scotia* and has taken a very precise view of innovation – one that can be defined and measured and that provides all stakeholders with the same focal point for action.

For purposes of this policy, innovation is defined as "the process by which new or improved products, services, practices, and processes are developed with an aim to commercialize." Not all products and services emanating from research and development can be expected to become commercial; commercialization in this context only implies an aim to commercialize.

Innovation is a knowledge-based activity that often, but not always, involves research and development. It can also involve technology acquisition and its adoption into new products, services, practices, and processes. Often, existing processes and technologies can be adopted and, by means of skilled management, can be the basis of innovation.

An innovator is "an individual, a firm, or an organization that undertakes activities aimed at commercializing new products, services, practices, and processes."

Innovation is carried out by firms and other organizations that aspire to supply products and services to the marketplace. This is an important point – innovation is not solely carried out by researchers, government, or financial institutions. However, it is important to recognize that innovation is facilitated and fostered through the firms' interactions with researchers, government, and financial and other institutions, and that these interactions are an integral part of the innovation process.

Innovation takes places in all economic sectors.

Commercialization, or the aim to commercialize, implies the application of resources for activities such as research and development, training, and product customization. It also implies undertaking risk and uncertainty to develop new or improved products, services, practices, and processes. Bringing an idea from inception to market is the process of commercialization. A cohesive innovation system will assist and accelerate the development of a new product or company through the specific challenges associated with the stages of the commercialization process.

Figure 2 summarizes the stages of the commercialization process.

Figure 2 Stages of the Commercialization Process

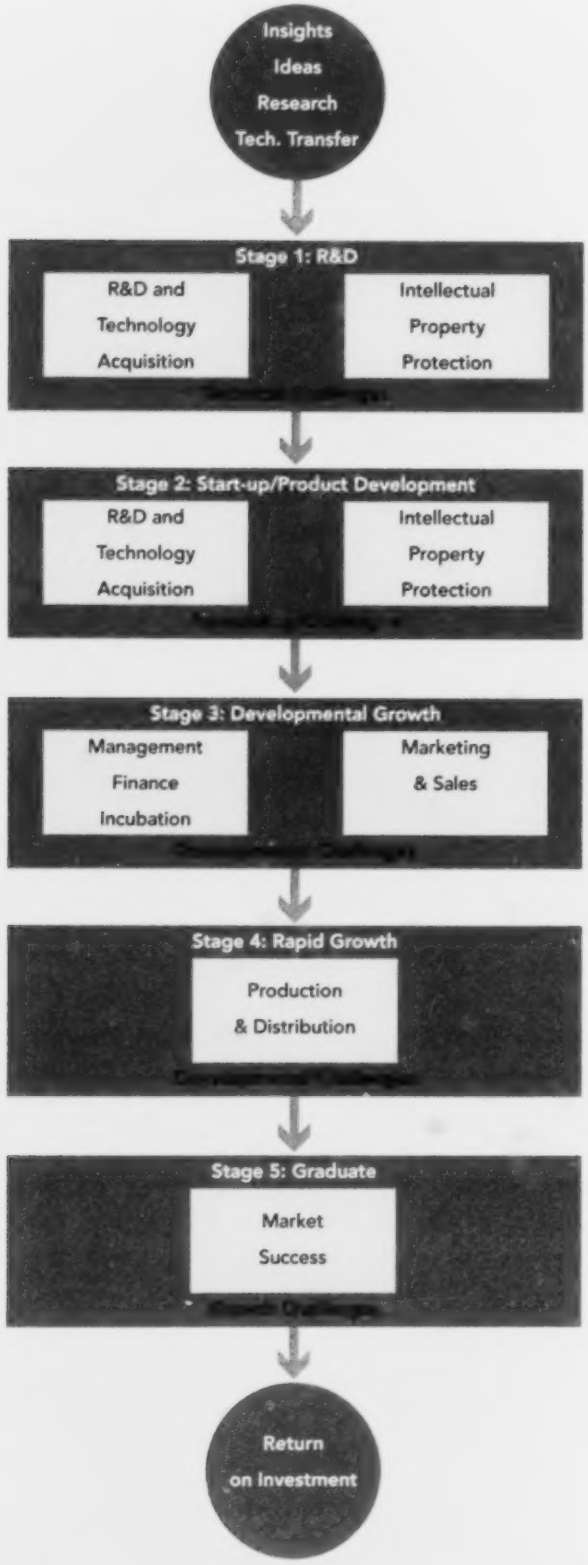


Figure 2 Stages of the Commercialization Process

An innovation system is "a set of institutions whose interactions positively influence the innovative performance of firms."

Social capital is the store of trust, mutual understanding, shared values, and behaviours that bind members of the Innovation System and make cooperative activity possible.

1.4 The Innovation System

An innovation system is "a set of institutions whose interactions positively influence the innovative performance of firms." Components of the innovation system (see Figure 1) are

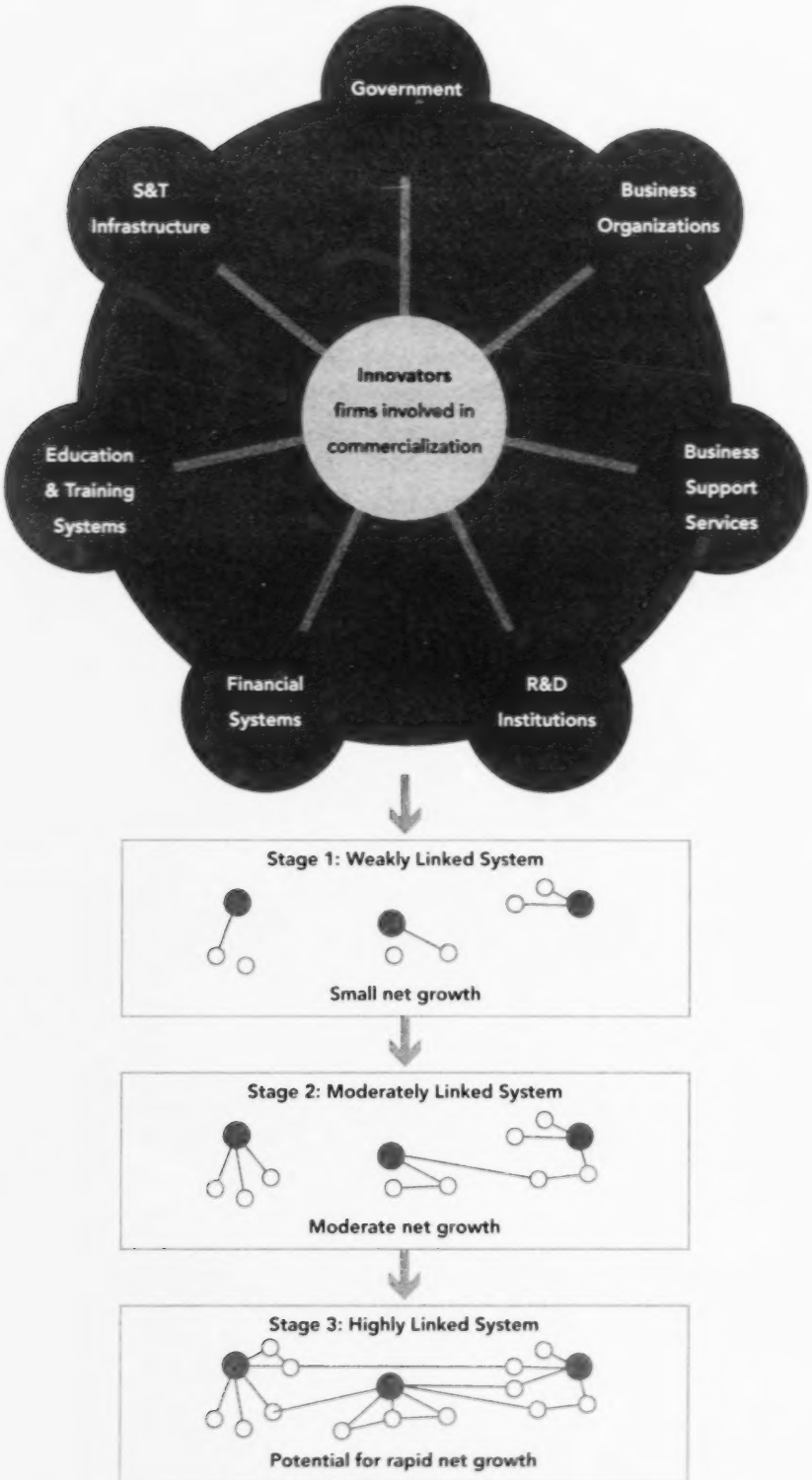
- individuals and firms at different levels of development
- institutions such as universities, research centres, and laboratories that perform and support aspects of R&D, knowledge generation, and innovation
- technology transfer agencies
- government programs and actions
- educational and training institutions
- art, design, and cultural organizations
- business and labour organizations and associations
- business support service providers (marketing, advertising, accounting, communications, legal, etc.)
- financial support systems, such as venture capitalists, equity issuers, and banks
- the science and technology infrastructure: testing facilities, standards and regulations, and methods for protecting intellectual property
- networks that facilitate the exchange and transfer of business, trade, technology, and technical information

The development of something new generally requires the capability to exploit the existing worldwide knowledge base, to adapt and adopt this knowledge, and sometimes to generate new knowledge. These capabilities exist both in the system (for example, in the region's R&D institutions and knowledge networks) and in the firm. Successful innovation is a product of this synergy.

The components of a region's innovation systems and the ways in which these components interact are key determining factors in the innovative performance of firms in the region. Indeed, a highly effective innovation system is often characterized by rapid growth in the related business sector. As innovation systems evolve, they typically pass through three stages, from weakly linked to highly linked, as illustrated in Figure 3. *A Stage 3 highly linked system is a vibrant network where people from various disciplines and walks of life exchange new ideas and work on common problems.*

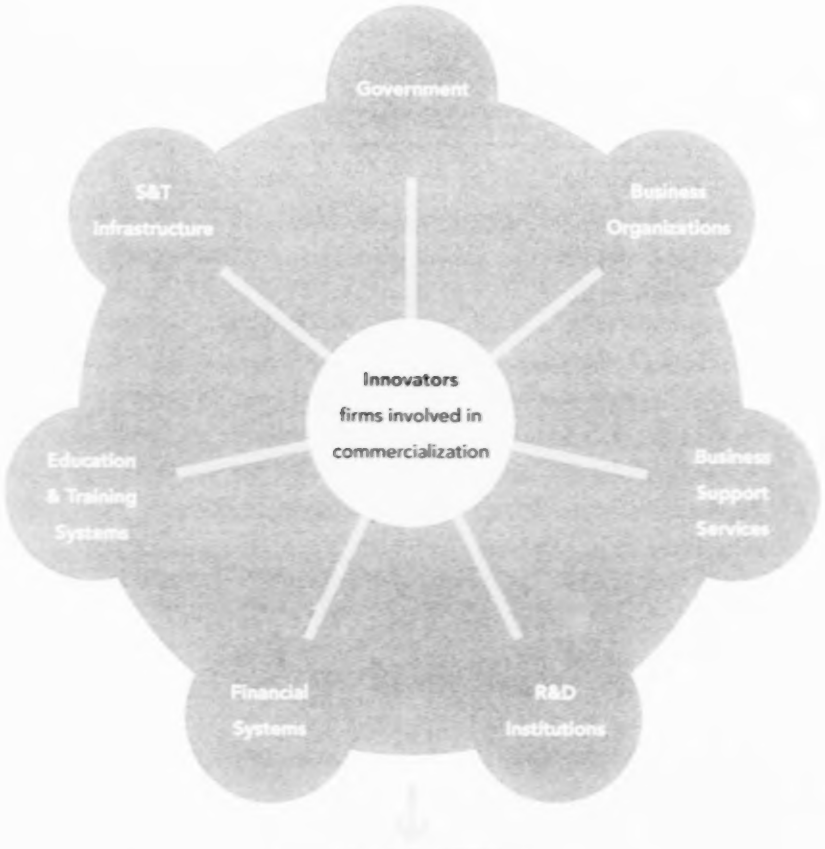
The challenge for Nova Scotia is to create an environment that supports and stimulates dynamic, strongly linked innovation systems throughout the province.

Figure 3 The Stages of Evolution of Innovation Systems



Social capital and co-operative activity increases as we move from stage 1 to 3.

Figure 3 The Stages of Evolution of Innovation Systems



Social capital and co-operative activity increases as we move from stage 1 to 3.

2 The Imperative for Innovation in Nova Scotia

This policy takes into account and reflects the following situation:

- The marketplace is becoming progressively more global.
- Knowledge and information are critical competitive factors for building economic strength.
- Innovation is vital to the economic success of the province.
- Innovation occurs best in a strongly linked environment.
- Nova Scotia's regions have distinct characteristics and strengths.
- Nova Scotia has many of the necessary components of strong innovation infrastructure.
- Nova Scotia has few firms with strong R&D capabilities.
- Access to capital is limited.
- Our innovation systems are weakly linked.

2.1 The Marketplace is Global

The marketplace is changing as it becomes progressively more globalized. Not only do we compete for external markets, but global organizations compete with us in our domestic markets – by being here and, increasingly, by serving us via the internet. This presents both challenges and opportunities for Nova Scotian firms.

Firms must rely increasingly on interaction with a variety of sources for complementary knowledge, know-how, and R&D, including equipment and component suppliers, customers/users, competitors, and non-market research institutions such as universities and government labs.

It is critical for our firms to access, understand, and integrate research and development undertaken here and around the world, and to use this knowledge to provide innovative products and services. Without this, our ability to produce marketable goods and services will diminish rapidly.

2.2 Knowledge is a Critical Competitive Factor in Building Economic Strength

Canada and Nova Scotia are witnessing and experiencing an economic transformation – the emergence of a new economy centred on knowledge, information, and associated human competencies.

Knowledge is being incorporated into new products and processes at such a rate that knowledge inputs are critical competitive factors in building economic strength.

Profound change is underway that alters our way of life. The challenge is to adapt. Canada is not alone – all developed economies face the same imperative head on. Free flow of capital, mobility of people and technology worldwide, and the ability of organizations to develop innovative products and processes make the difference between success and failure.

2.3 Innovation is Vital to the Future Economic Success of Nova Scotia

Our economic competitiveness, our high standard of living, and our social well-being all depend upon creating a dynamic, innovative economy. To do that, we must understand and meet the demands of globalization, trade liberalization, sustainable development, and an ever-increasing rate of technological change.

International experience shows us that economies thrive where innovation systems are strong: *Innovation is vital to the future economic success of Nova Scotia.*

2.4 Innovation Occurs in a Strongly Linked Environment

R&D is important, but innovation is usually not the direct, linear result of R&D. Firms invest in R&D to develop new or improved products and services. The more pertinent outcome of R&D, however, is the development of competencies and enhanced capacity to exploit the existing worldwide knowledge base, to adapt and adopt this knowledge, and sometimes to generate new knowledge.

There is a growing body of evidence showing that the development of new researchers, the establishment of facilities, and the development and strengthening of linkages between knowledge workers and organizations contribute to the future innovative performance of a region.

2.5 Nova Scotia's Regions Have Distinct Characteristics and Strengths

In the case of Nova Scotia, we are dealing with unique regional cultures and landscapes. Distinct economies – many based on indigenous cultural assets or nearby natural resources – arise from a strong sense of community and service.

Especially in the more rural areas, secondary and post-secondary institutions provide a community base with solid linkages to their local economies.

2.6 Nova Scotia has Many of the Necessary Components of an Innovation Infrastructure

Nova Scotia is already well on its way to evolving its innovation-system network. Along with an established network of supportive public sector departments and agencies, Nova Scotia has some excellent innovation infrastructure components in place in a number of key areas including the following:

A strong core of post-secondary institutions:

- Our 11 degree-granting institutions include a medical school and strong engineering faculty. Nova Scotia has a current undergraduate enrolment of 36,071 and a graduate enrolment of 5,048.
- The Nova Scotia Community College has 13 campuses across the province offering certificates, diplomas, and advanced programs in applied arts to over 13,000 students. They are one of the few colleges in Canada to be successful in receiving Canada Foundation for Innovation awards.
- The Nova Scotia Agricultural College (NSAC), an internationally respected teaching and research institution, provides education in the science and management of agriculture and related disciplines.

Commercialization and business-development support organizations and programs:

- InNOVAcorp, a provincial Crown corporation, provides investment, incubation, and mentoring services that help emerging technology-oriented firms become globally competitive.
- The First Nova Scotia Fund of $8 million, managed by InNOVAcorp, focuses on supporting emerging companies.
- Nova Scotia Business Inc. (NSBI), a provincial Crown corporation, has a mandate to expand business activity in Nova Scotia.
- AgriTECH Park, a business development and support facility located in Truro, focuses on serving the needs of agricultural, food, and environmental sector firms and organizations.
- The Telecom Applications Research Alliance (TARA), a Cisco-Certified Internetworking Expert (CCIE) Certification Lab, offers a Master of Engineering in Internetworking in affiliation with Dalhousie University. TARA invests in and mentors telecommunication-oriented companies.
- The Industrial Research Assistance Program (IRAP) of the National Research Council (NRC) provides technology and business assistance to small and medium-sized enterprises (SMEs).

Internationally recognized research and development institutions and support programs:

- The $15 million Research and Innovation Trust Fund, established in 2001, helps Nova Scotia's research institutions leverage and secure grants from programs such as the Canada Foundation for Innovation.
- The Brain Repair Centre (BRC), a multi-disciplinary collaboration linking more than 100 world-class researchers and physicians, specializes in groundbreaking treatments and leading-edge technologies in the field of brain repair.
- Genome Atlantic is one of five regional research centres established across Canada to promote genomics research in Canada.
- The Centre for Excellence in Information Technology (CEIT), a new incubator and research facility sponsored by the National Research Council (NRC), is located at University College of Cape Breton (UCCB).
- The Bedford Institute of Oceanography (BIO) is world-recognized for its excellence in ocean-related research.
- The National Research Council's Institute for Marine Biosciences is the founding hub of NRC's extensive bio-informatics network and a key point of entry into NRC's full suite of research institutes.
- The Defence Research Establishment Atlantic (DREA) is one of five research establishments in the Department of National Defence.
- The Nova Scotia Research and Development Tax Credit (R&D credit) offers tax relief to incorporated Nova Scotia firms that incur qualified scientific research and experimental development (SR&ED) expenditures made in Nova Scotia.

- The $300 million Atlantic Innovation Fund (AIF), administered by the Atlantic Canada Opportunities Agency (ACOA), is designed to increase the region's capacity to carry out leading-edge research and development.
- The federal/provincial Information Economy Initiative (IEI), which has resulted in a total investment of more than $90 million, is aimed at strengthening the key infrastructure components of the knowledge-based economy.
- An effective network of industry sector associations, such as the Life Science Development Association (LSDA), the Information Technology Association (ITANS), the Offshore Technology Association (OTANS), BioNova, The Music Industry Association of Nova Scotia(MIANS), and many others, network closely with our educational and governmental institutions.

2.7 Nova Scotia has Few Firms with Strong R&D Capabilities

The Nova Scotia economy is characterized by many small firms, a modest number of medium-sized enterprises, and few large enterprises. Of these large enterprises, many are branch plants with little or no R&D mandate. According to Statistics Canada, more than 90 per cent of businesses in Nova Scotia have less than 50 employees (Statistics Canada, Employment Dynamics 1999–2000).

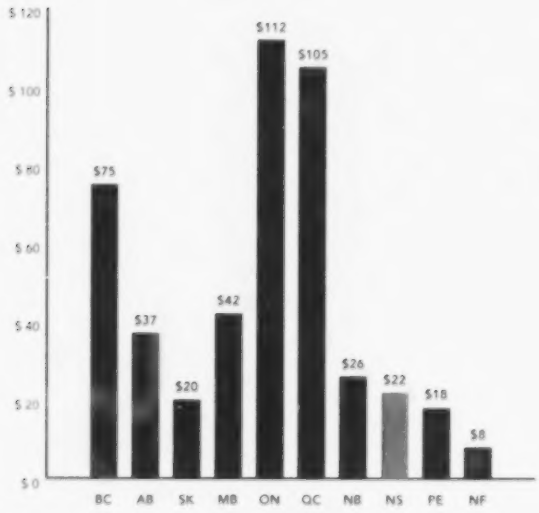
The entrepreneurial nature of small and medium-scale enterprises brings a flexible and dynamic focus to the economy that can certainly enhance competitiveness. However, the relative lack of large-sized enterprises limits the support this element of the economy can provide to the small-to-medium enterprises (SMEs). This is particularly true when it comes to developing good business practices and building the network of joint ventures and strategic alliances that characterize successful knowledge-based businesses.

2.8 Financing Innovation

The development and commercialization of innovative products, services, practices, and processes requires significant investment. For small and medium enterprises this represents a significant hurdle. Nova Scotia needs to focus its attention on the commercialization of innovation to build on the substantive investments already made in research and development. Such investment can be raised through a number of sources: venture capital, seed and angel financing, granting council funds, as well as other sources of funding support.

Nova Scotia falls behind many other provinces in financing the commercialization process. As an example, from 1996 to 2001, an average of $21 million per year in venture capital funds was invested in the province. This represents $22 per capita, well below the national average of $85 per capita.

Figure 4 Venture Capital – Annual Investment per Capita



Source: Based on Statistics Canada and Macdonald and Associates Ltd. 1996–2001 averaged data.

2.9 Our Innovation Systems are Weakly Linked

In extensive one-on-one and group interviews with hundreds of individuals and firms across the province, Nova Scotians have told us that our innovation systems can be characterized as being embryonic and relatively weakly linked (see Figure 2).

Notable exceptions are the innovation systems within the entertainment (film, music) industry and in agriculture. In both areas, we have a large number of primarily small firms, strong support from the educational system, and modest support from the university system as well as from other federal and provincial innovation assets. Both areas are showing signs of increasingly rapid growth.

While there are other emerging sectors (life sciences, ocean sciences, consulting engineering, software development), the linkages between the sectors and with other potentially supportive components of the innovation system do not exist or are tenuous.

Nova Scotia is particularly well-endowed with universities. A number of cooperative joint ventures do exist, but the overall linkages among the various institutions are not well established from an innovation perspective.

Figure 5 summarizes the main characteristics of our innovation system.

Figure 5 Nova Scotian Innovation System Environment – Assets and Challenges

Assests	Challenges
Strong university base	No strong connection with innovators
Economy SME dominated	Lack of large corporate players with R&D mandate
Strong entrepreneurial culture	Innovation Skills and competencies need development
Strong historical culture base	Difficulty in embracing a strong global growth orientation
Active governments	Lack of co-ordinated policy and strategy across levels of government
Strong urban centre	Gap between urban and rural

3 The Innovation Policy

3.1 The Provincial Government can Influence Levels of Innovation in Nova Scotia

According to Statistics Canada, the federal government and higher education institutions continue to be the major sources of funds for R&D in Nova Scotia. Of the $360 million spent on R&D in the year 2000, the federal government provided 36 per cent ($129 million), higher education 33 per cent ($120 million), business enterprises 18 per cent ($64 million), sources outside Canada 6 per cent ($20 million), the provincial government 4 per cent ($15 million), and the private non-profit sector 3 per cent ($12 million).

Regardless of the extent of investment on direct R&D, the provincial government has many levers with which to influence the innovative performance of the provincial economy.

The provincial government can influence the evolution of innovation in Nova Scotia.

3.2 The Policy

Innovative Nova Scotia is targeted at enabling innovators by supporting and strengthening innovation systems that are integral to the innovation process. The policy recognizes the critical importance of developing the skills and capacities of the people who work within innovation systems.

The policy is designed to assist innovators in *all economic sectors and all regions of the province.*

Government will facilitate, not direct. The Government of Nova Scotia will work with other levels of government, with the private sector, with universities and colleges, with public institutions, and with all the other components of our innovation systems.

The government will become a key influence in facilitating innovation in the province. The policy will become a fundamental support to government's Economic Growth Strategy, *Opportunities for Prosperity.*

Goal

To grow and expand innovation in Nova Scotia so that it matches or exceeds the innovation performance of the leading regions in the nation.

3.3 Policy Goals and Objectives

This policy has an ambitious and achievable long-term goal, and one which needs to be measurable so that we can monitor how well we are doing:

To grow and expand the use of innovation in Nova Scotia so that it matches, or exceeds, the innovation performance of the leading regions in the nation.

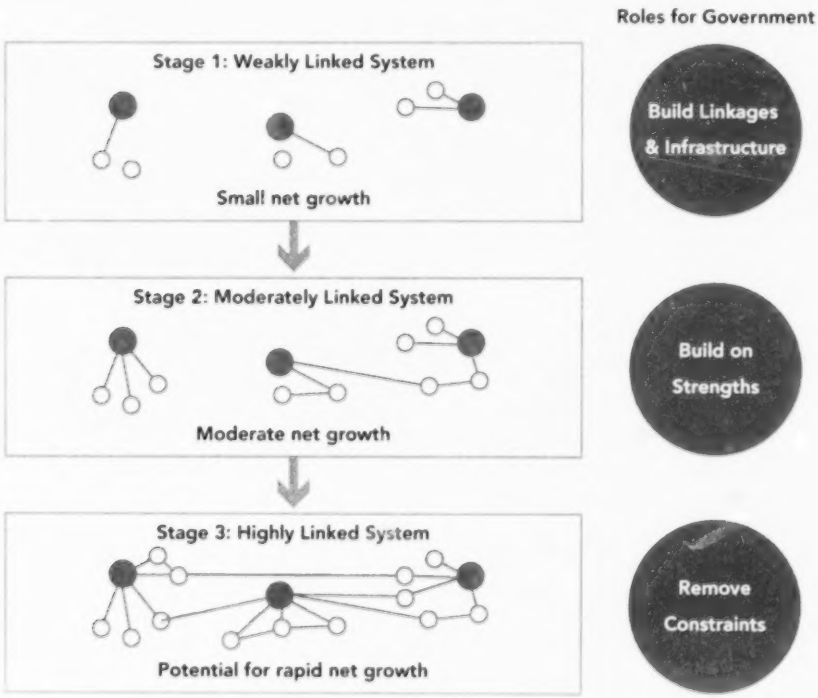
The achievement of this ambitious goal is a long-term process. Our short-term objective recognizes the current situation and focuses on helping to move the province's innovation systems to the next stage of development.

The objective of the first stage of policy implementation is to build up the critical linkages and infrastructure of the innovation systems that connect the following:

- Innovators: individuals, firms, or organizations that undertake activities aimed at commercializing new products
- Capabilities that exist outside of Nova Scotia, including ideas, technologies, and processes
- Post-secondary education and training organizations
- Federal, provincial, and private-sector innovation resources

Figure 6 Roles for Government in the Evolution of Innovation Systems

A Stage 3 highly linked system is a vibrant network where people from various disciplines and walks of life exchange new ideas and work on common problems.



3.4 Strategic Directions and Initiatives

Government will address its Stage 1 objective – to build up critical linkages and innovation infrastructure – through a range of strategic directions and initiatives in five policy areas: R&D support, innovation infrastructure support, human resource development, commercialization support, and direct government action.

Objectives, directions, and initiatives for the later stages will be developed in response to the ongoing development of the province's innovation systems as they become more highly linked and mutually supporting.

Given the current weakly linked state of our innovation systems and the need to build critical linkages and innovation infrastructure, each policy area has to be precisely focused to address the objective. Accordingly, the province has identified a strategic direction for each policy area:

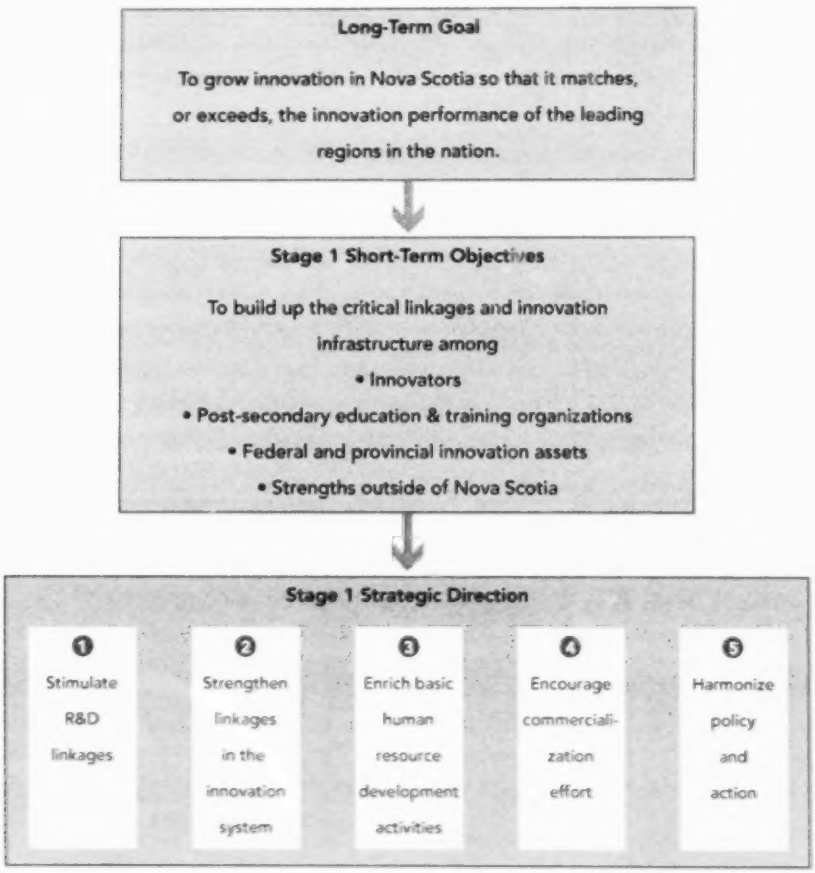
Policy Area	Stage 1 Strategic Direction
R&D Support	Stimulate R&D Linkages
Innovation Infrastructure Support	Strengthen Linkages in the Innovation System
Human Resource Development	Enrich Basic HRD Activities
Commercialization Support	Encourage Commercialization Efforts
Direct Government Action	Harmonize Policy and Action

Figure 7 illustrates how the policy strategic directions emanate from the long-term goal and the Stage 1 objective.

Long-Term Goal
To grow innovation in Nova Scotia so that it matches, or exceeds, the innovation performance of the leading regions in the nation.
Stage 1 Short-Term Objectives
To build up the critical linkages and innovation infrastructure among
• Innovators
• Post-secondary education & training organizations
• Federal and provincial innovation assets
• Strengths outside of Nova Scotia
Stage 1 Strategic Direction
1
Stimulate R&D linkages
2
Strengthen linkages in the innovation system
3
Enrich basic human resource development activities
4
Encourage commerciali-zation effort
5
Harmonize policy and action

Figure 7 Innovation Policy Directions

Figure 7 illustrates how the policy strategic directions emanate from the long-term goal and the Stage 1 objective.


Long-Term Goal
To grow innovation in Nova Scotia so that it matches, or exceeds, the innovation performance of the leading regions in the nation.
Stage 1 Short-Term Objectives
To build up the critical linkages and innovation infrastructure among
• Innovators
• Post-secondary education & training organizations
• Federal and provincial innovation assets
• Strengths outside of Nova Scotia
Stage 1 Strategic Direction
1 Stimulate R&D linkages
2 Strengthen linkages in the innovation system
3 Enrich basic human resource development activities
4 Encourage commercialization effort
5 Harmonize policy and action

4 Strategic Directions and Initiatives

Preference will be given to specific initiatives and activities aimed at improving innovation through strengthened system linkages and infrastructure. As linkages are built and as the provincial government becomes more effective in helping to strengthen innovation systems, it will be laying the foundations for longer-term, self-sustaining economic growth.

The initiatives listed below are meant to stimulate discussion. They come primarily from the hundreds of Nova Scotians who have been consulted via interviews, focus groups, and on-line surveys undertaken as part of the policy-development process.

This is what we have heard to date.

4.1 Stimulate R&D Linkages

R&D is an important component of innovation. The extent to which research directly contributes to the further development of stronger, more effective innovation systems depends on the extent to which researchers are closely linked with the intended users of the research results.

R&D support will be directed to stimulating the establishment of a wide range of productive R&D linkages in an effort to encourage the targeted development of the province's competence and knowledge base. Why is such a focus needed? Because while there is already considerable R&D capability, there are insufficient linkages among the centres of expertise, and insufficient linkages between these centres and innovating firms and organizations.

To stimulate R&D linkages, the following initiatives are proposed:

Support enhanced access to funds from granting councils and other innovation program funding sources by

- establishing grants or providing expertise, or both, to support the development of proposals and business plans
- providing access to facilitators to enable organizations across all sectors to form the alliances needed to access these funds

4.2 Strengthen Linkages in the Innovation System

There are a variety of mechanisms used by provincial governments to develop and enhance the linkages among the different components of the innovation system. These programs have high potential for generating benefits at a low cost. The province will focus on building dynamic linkages among elements of the innovation system.

To strengthen linkages in the innovation system, the following initiatives are proposed:

- Provide support to firms that wish to undertake directed R&D with universities.
- Improve access to, and dissemination of, information on key resources in the innovation system, commercialization, and science and technology via the development of an Internet-based innovation portal. Use the innovation portal and other vehicles to stimulate early-stage investment in firms by linking firms and investors.
- Support innovation-specific activities of new and existing networking organizations and sector associations.
- Support the development of innovation action plans and activities within and between regions, and at the community level, that support and augment the policy.
- Hold regional and provincial innovation summits to provide an opportunity for active sharing of ideas and experiences, as well as an opportunity to recognize innovation excellence in SMEs throughout Nova Scotia.
- Establish mentoring programs using experienced executives to help SMEs become more innovative.

4.3 Enrich Basic Human Resource Development Activities

The Department of Education has recently released Skills Nova Scotia, a long-term strategic framework for addressing the skill needs of the Nova Scotia labour force. It will be important to ensure that any human resource related initiatives stemming from the implementation of Innovative Nova Scotia fits in the broader context of the Skills Nova Scotia strategic framework.

To enrich basic human resource development activities, the following initiatives are proposed:

- Support programs that link firms with graduate students in Nova Scotia universities.

- Provide support and technical assistance to
  - encourage the development of customized training programs to meet the needs of innovative firms
  - increase access to existing programs, including on-line learning, especially in rural communities where access is an issue
- Introduce programs to encourage the recruitment of technical and managerial expertise by SMEs to enhance commercialization capabilities within these firms.

4.4 Encourage Commercialization Efforts

Encouraging, expanding, and aligning existing commercialization efforts and programs will help to maximize the positive impact on Nova Scotia's Innovation systems. There is a need also to focus government effort towards addressing existing gaps in the Nova Scotia commercialization environment.

To encourage commercialization efforts, the following initiatives are proposed:

- Examine opportunities for improved collaboration among existing commercialization-focused programs and between the agencies and organizations that provide these programs.
- Identify and address the under-served areas of innovation-related business planning, product development management, marketing and distribution, and other business support services.
- Develop approaches and programs to help expand opportunities for innovators to access capital.

4.5 Harmonize Policy and Action

Government actions contribute directly to increasing innovation system linkages and benefits. The province will focus on harmonizing government programs and actions that relate to this policy.

To harmonize policy and action, the following initiatives are proposed:

- Establish the Premier's Advisory Council on Innovation to provide broad, high-level support, direction, and linkages to help achieve the objectives of the Innovative Nova Scotia Policy framework.
- Review the effectiveness of the provincial contribution to the SR&ED tax credit and implement changes where warranted.
- Evaluate the effectiveness of the existing system and approach for the administration and disbursement of funds from the Nova Scotia Research and Innovation Trust Fund. Consider options for longer-term funding support.
- Leverage government's buying power to stimulate innovative activity in Nova Scotia firms.

5 Conclusion

5.1 The Challenge – Putting People First

A primary aim of *Innovative Nova Scotia* is to help Nova Scotians achieve the skills and vision to take an innovative approach to growing the Nova Scotia economy. As in anything, more money will not necessarily provide all solutions. We can put wires and laboratories in businesses and schools, but it is the creative power of people that makes the technology work. Similarly, when it comes to our innovation systems, we must not lose sight of the people behind the systems. With the full development of their creative potential, Nova Scotians will always be able to master the complex problems and magnificent opportunities of today's world.

The implementation of Innovative Nova Scotia *will help develop this creative potential to ensure broad-based benefits to Nova Scotia and Nova Scotians.*

For Innovators

- Increased wealth and business opportunities for future growth
- Increased collaboration among innovators, providing greater access to ideas and resources

For Post-Secondary Institutions

- Clear, articulated roles for universities and colleges in the innovation environment and innovation systems
- Enhancement of the innovation infrastructure to enable fulfilment of these roles:
  - stronger linkages to innovators
  - stronger program links among universities and colleges
  - increased capacity to support firms in Nova Scotia
- Strengthened linkages to other assets in Nova Scotia and elsewhere

For Government

- Internal provincial government policy cohesion, particularly with the province's Economic Growth Strategy
- Consistency of innovation-related policy instruments and approaches across all levels of government
- Strengthened linkages to innovators and all components of the innovation system

5.2 Measurement

The Government of Nova Scotia is committed to developing measures that are relevant to the policy and to the needs and requirements of the various stakeholders in the Nova Scotia innovation system. Indicators will be developed in concert with work currently underway at the national level by Industry Canada and other provincial or territorial jurisdictions.

From a Nova Scotia perspective, the measurement process will coordinate with efforts being undertaken by Nova Scotia Economic Development (Business Climate Index), the Department of Education (Skills Nova Scotia), and NovaKnowledge (Knowledge Economy Report Card).

5.3 Implementation

Implementation of *Innovative Nova Scotia* will be the responsibility of Nova Scotia Economic Development (NSED). In carrying out this responsibility, NSED will work in partnership with provincial departments, other levels of government, the private sector, institutions of higher education, and all other components of the innovation system.

The Premier's Advisory Council on Innovation will provide a key source of guidance and direction to help frame and energize the policy implementation effort. Establishment of the Council will contribute independent advice and direction to government to help maximize the potential economic and social benefits enhanced innovation offers to Nova Scotians.